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In re patent application

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Examiner: Kebede, Brook

For: WHITE LIGHT EMITTING DEVICE

Commissioner for Patents

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PRIOR ART SUBMISSION

Sir:

For the possible benefit of anyone subsequently evaluating the scope and/or validity of the above patent, it is respectfully requested that the enclosed English translation of the Chinese Office Action dated February 2, 2007, be placed in the file wrapper:

The undersigned has not reviewed the teachings of these references in detail and thus, makes no representations concerning their relevancy or materiality.

No fees are believed to be necessary, however, please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-0481.

Respectfully submitted,

Date: 5/25/07

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THE DETAILS OF THE FIRST OFFICE ACTION

The present application relates to a white light emitting device. Through examination, the detailed opinions are provided as follows.

CLAIM REJECTIONS

1. The technical solution claimed for protection in the independent claim 1 does not possess novelty, which is not in conformity with Article 22(2) of the Chinese Patent Law.

Reference 1 (WO01/89000A1) discloses a white light emitting device with the following technical features (referring to line 14, page 3-line 17, page 4; and line 3, page 6-line 4, page 10 in the specification and figures 1-4): the white light illumination system has a LED chip 11 having a peak emission wavelength between 370 and 405nm, a first phosphor 3 which absorbs the incident radiation from the LED chip 11 and emits orange light having a peak emission wavelength of 570nm, and a second phosphor 4 which absorbs the incident radiation from the LED chip 11 and emits blue-green light having a peak emission wavelength between 480 and 500nm.

As apparent from above, reference 1 has disclosed all the technical features of the independent claim 1. The technical solution disclosed in reference 1 and the technical solution claimed for protection in the independent claim 1 pertain to the same technical field, solve the same technical problems and produce the same technical effects. Therefore, the technical solution claimed for protection in the independent claim 1 does not possess novelty.

(The following is a quotation of the Chinese Patent Law:

Article 22(2) Novelty means that, before the date of filing, no identical invention or utility model has been publicly disclosed in publications in the country or abroad or has been publicly used or made known to the public by any other means in the country, nor has any other person filed previously with the Patent Administration Department Under the State Council an application which described the identical invention or utility model and was published after the said date of filing.)

2. The technical solution of the dependent claim 2 does not possess novelty, which is not in conformity with Article 22(2) of the Chinese Patent Law.

As disclosed in reference 1 (referring to line 25-27, page 8 in the specification), the LED may have an emission wavelength preferably between 370 and 390nm. That is, the additional technical features of the dependent claim 2 are also disclosed in reference 1. In the case that claim 1 to which claim 2 refers does not possess novelty, claim 2 does not possess novelty either.

Meanwhile, claim 2 does not conform to Rule 20(1) of the Implementing Regulations of the Chinese Patent Law.

The technical term "emission wavelength" is not clearly defined in claim 2. "Emission wavelength" is commonly used to refer to the wavelength of light emitted from a light emitting chip, while in claim 1 "...a second phosphor with a different emission wavelength..." is also mentioned. Therefore, the term "emission wavelength" in claim 2 can be either the wavelength of light emitted from a light emitting chip or the wavelength of light emitted from the second phosphor, which render the protection scope of claim 2 unclear. The applicant should clearly define the term "emission wavelength" in claim 2 according to the specification, thus making "emission wavelength" clearly refer to the wavelength of light emitted from a light emitting chip.

(The following is a quotation of the Implementing Regulations of the Chinese Patent Law:

Rule 20(1) The claims shall define clearly and concisely the matter for which protection is sought in terms of the technical features of the invention or utility model.)

3. The technical solution of the dependent claim 3 does not possess novelty, which is not in conformity with Article 22(2) of the Chinese Patent Law.

Reference 1 (referring to line 1-5, page 7 in the specification) discloses the use of a second blue-green emitting phosphor. It can be seen that additional technical features of the dependent claim 3 are also disclosed in reference 1. In the case that claim 1 to which claim 3 refers does not possess novelty, claim 3 does not possess novelty either.

4. The technical solution of the dependent claim 4 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Although reference 1 (referring to line 1-5, page 7 in the specification) discloses the use of a second blue-green emitting phosphor, it is well known in this field that the second phosphor could be any one of a blue phosphor, a red phosphor and a green phosphor, or a combination thereof, so as to emit white light. The technical solution disclosed in reference 2 (JP kokai2002-76445A) realizes the emission of white light through combined use of a blue phosphor, a red phosphor and a green phosphor at the same time (referring to paragraph 20-22, page 5 in the specification). Accordingly, the technical solution claimed for protection in claim 4 neither have any prominent substantive features nor represent any notable progress over the cited references.

(The following is a quotation of the Chinese Patent Law:

Inventiveness means that, as compared with the technology existing before the date of filing, the invention has prominent substantive features and represents a notable progress and that the utility model has substantive features and represents progress.)

5. The technical solutions of the dependent claims 5 and 6 do not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

The use of europium-activated alkaline earth metal silicates to constitute a phosphor is a generally known technical method in this field. For instance, reference 3 (CN1349262A) discloses the use of europium-activated alkaline earth metal silicates, such as $(\text{Sr}, \text{Ba})_2\text{SiO}_4:\text{Eu}$, $\text{Ca}_2\text{MgSi}_2\text{O}_7:\text{Eu}$ and the like, as a phosphor (referring to line 27-30, page 3 in the specification). As seen from the above, the technical solutions claimed for protection in the dependent claims 5 and 6 do not have any prominent substantive features and represent any notable progress over the cited references.

6. The technical solutions for which protection is sought in the dependent claims 8 and 9 do not possess novelty, which is not in conformity with Article 22(2) of the Chinese Patent Law.

Reference 1 (referring to figure 4) discloses a technical solution which, with high densities, intersperses the blue-green emitting phosphors and orange emitting phosphors within the covering member attached to the light emitting element. It can be seen that additional technical features of the dependent claims 8 and 9 are also disclosed in reference 1. In the case that claim 1 does not possess novelty, claim 8 does not possess novelty either, and this in turn leads to the lack of novelty in claim 9.

7. The technical solution for which protection is sought in the dependent claim 10 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Claim 10 refers to claim 8 and further defines that phosphors are also interspersed in the insulation adhesives on the lead frame. As recited in the specification, such an additional technical feature serves to improve the light conversion efficiency.

However, it is disclosed in reference 4 (CN1366714A) that phosphors are interspersed in the insulation adhesives on the lead frame in order to improve the light conversion efficiency of the light emitting element (referring to line 3, page 9 to line 22, page 10 in the specification and figures 2-3). As reference 4 inspires the application of the above-mentioned technical features to reference 1 so as to solve technical problems thereof, it would be obvious to those skilled in the art that by combining reference 4 with reference 1, the technical solution claimed for protection in claim 10 could be obtained. Therefore, the technical solution claimed for protection in claim 10 does not have any prominent substantive features and represent any notable progress, thereby lacking in inventiveness.

8. The technical solution for which protection is sought in the independent claim 11 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Reference 2 (JP 特开 2002-76445A) discloses a white light emitting device and specifically discloses the following technical features (referring to paragraph 20-23, page 5 in the specification, and figures 1, 2, 3, and 5): a purple light emitting device 4 disposed in a cup 3 of a installation guide and consisting of InGaN semiconductor (which amounts to GaN semiconductor); seal material 8 filled in cup 3 and sealing the light emitting element 4, which consists of transparent resin; and a phosphor layer 10 combined in seal material 8, which consists of red, green and blue phosphors which absorb light emitted from the purple light emitting device and emit red, green and blue light respectively.

When compared with the technical solution disclosed in reference 2, the technical solution claimed for protection in claim 11 differs only in the yellow phosphors included in the phosphors. As recited in the specification, the yellow phosphors serve to enhance the color rendering of the white light.

However, it is disclosed in reference 5 (JP Kokai 11-39917A) that the luminescent spectrum of a white light emitting device consisting of red, green and blue LEDs has a low intensity of the yellow light and this causes deteriorated color rendering of the white light. However, when yellow phosphors are added in the wavelength conversion layer, the color rendering of the white light is improved (referring to paragraph 13-15, page 3, in the specification). As seen from above, reference 5 discloses the distinguishing technical feature of claim 11 from reference 2, and said feature serves the same function in reference 5 as it does in claim 11. Therefore, it would be obvious for those skilled in the art to combine reference 5 with reference 2 so as to obtain the technical solution claimed for protection in claim 11. As a result, the technical solution claimed for protection in claim 11 does not have any prominent substantive features and represent any notable progress, thereby resulting in lack of inventiveness of claim 11.

9. The technical solution for which protection is sought in the dependent claim 12 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Reference 2 (referring to figure 1, 2 and 6) discloses a lens-like casting member 12 consisting of transparent resin, which fills a cup 3 and a part of a installation guide. It is clear that additional technical features of the dependent claim 12 are also disclosed in reference 2. In the case that claim 11 to which claim 12 refers does not possess inventiveness, claim 12 does not involve inventiveness either.

10. The technical solution for which protection is sought in the independent claim 13 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Reference 2 (JP Kokai 2002-76445A) discloses a white light emitting device and specifically discloses the following technical features (referring to paragraph 20-23, page 5 in the specification, and figures 1-6): a purple light emitting device 4 disposed in a cup 3 of a installation guide and consisting of InGaN semiconductor (which amounts to GaN

semiconductor); seal material 8 filled in cup 3 and sealing the light emitting element 4, which consists of transparent resin; a phosphor layer 10 combined in seal material 8, which consists of red, green and blue phosphors which absorb light emitted from the purple light emitting device and emit red, green and blue light respectively; and a lens-like casting member 12 consisting of transparent resin, which fills cup 3 and a part of the installation guide.

When compared with the technical solution disclosed in reference 2, the technical solution claimed for protection in claim 13 differs in that: (a) the phosphors include yellow phosphors; and that (b) the phosphors are located in the phosphor cover. As recited in the specification, the distinguishing technical feature (a) has a function of enhancing the color rendering of the white light while the distinguishing technical feature (b) serves to reduce the scattering of the light emitted from the phosphors with the film-like shape of the phosphor cover.

However, it is disclosed in reference 5 (JP 特开平 11-39917A) that the luminescent spectrum of a white light emitting device consisting of red, green and blue LEDs has a low intensity of the yellow light and this causes deteriorated color rendering of the white light. However, when yellow phosphors are added in the wavelength conversion layer, the color rendering of the white light is improved (referring to paragraph 13-15, page 3, in the specification). As clear from above, reference 5 has disclosed the distinguishing technical feature (a) and this feature serves the same purpose in reference 5 as it does in claim 13. Meantime, reference 6 (JP 特开 2000-156526A) discloses a phosphor cover 220 consisting of phosphors. Said phosphor cover 220 is used to convert the wavelength of the light emitted from a LED chip and thereby emits white light (referring to paragraph 19, page 3 in the specification and figure 3). The phosphor cover 220 has a film-like shape which can also reduce the scattering of the light emitted from the phosphors. Therefore, the distinguishing technical feature (b) has been disclosed in reference 6 and has the same effects therein. Accordingly, it is obvious that those skilled in art may combine references 5 and 6 with reference 2 to reach the technical solution claimed for protection in claim 13. As a result, the technical solution claimed for protection in claim 13 does not have any prominent substantive features and represent any notable progress, thereby resulting in lack of inventiveness.

11. The technical solution for which protection is sought in the independent claim 14 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Reference 2 (JP 特开 2002-76445A) discloses a white light emitting device and specifically discloses the following technical features (referring to paragraph 20-23, page 5 in the specification, and figures 1-6): a purple light emitting device 4 disposed in a cup 3 of a installation guide and consisting of InGaN semiconductor (which amounts to GaN semiconductor); seal material 8 filled in cup 3 and sealing the light emitting element 4, which consists of transparent resin; a phosphor layer 10 combined in seal material 8, which consists of red, green and blue phosphors which absorb light emitted from the

purple light emitting device and emit red, green and blue light respectively; and a lens-like casting member 12 consisting of transparent resin, which fills the cup 3 and a part of the installation guide.

When compared with the technical solution disclosed in reference 2, the technical solution claimed for protection in claim 14 differs in that (a) the phosphors also include yellow phosphors; and that (b) there is a substantially rectangular light guide, which introduces the light emitted from the light emitting element and outputs it from a light output surface, and phosphors are coated on this light guide. As recited in the specification, the distinguishing technical feature (a) has a function of enhancing the color rendering of the white light while the distinguishing technical feature (b) is regarded as an alternative light emitting structure in this field.

However, it is disclosed in reference 5 (JP 特开平 11-39917A) that the luminescent spectrum of a white light emitting device consisting of red, green and blue LEDs has a low intensity of the yellow light and this causes deteriorated color rendering of the white light. However, when yellow phosphors are added in the wavelength conversion layer, the color rendering of the white light is improved (referring to paragraph 13-15, page 3, in the specification). As clear from above, reference 5 has disclosed the distinguishing technical feature (a) and this feature serves the same purpose in reference 5 as it does in claim 14. Meantime, reference 6 (JP 特开 2000-156526A) discloses a technical solution having a substantially rectangular light guide 410. This light guide 410 introduces the light emitted from the light emitting element and outputs it from a light output surface, and phosphors 430 are coated on the light output surface of the light guide 410 (referring to paragraph 30-35, page 4 in the specification, and figure 8-10). Therefore, the light emitting structure of the distinguishing technical feature (b) has been disclosed in reference 6. Accordingly, it is obvious that those skilled in art may combine references 5 and 6 with reference 2 to reach the technical solution claimed for protection in claim 14. As a result, the technical solution claimed for protection in claim 14 does not have any prominent substantive features and neither does it represent any notable progress, thereby resulting in lack of inventiveness.

12. The technical solution for which protection is sought in the independent claim 15 does not possess inventiveness, which is not in conformity with Article 22(3) of the Chinese Patent Law.

Reference 2 (JP 特开 2002-76445A) discloses a white light emitting device and specifically discloses the following technical features (referring to paragraph 20-23, page 5 in the specification, and figures 1-6): a purple light emitting device 4 disposed in a cup 3 of a installation guide and consisting of InGaN semiconductor (which amounts to GaN semiconductor); seal material 8 filled in cup 3 and sealing the light emitting element 4, which consists of transparent resin; a phosphor layer 10 combined in seal material 8, which consists of red, green and blue phosphors which absorb light emitted from the purple light emitting device and emit red, green and blue light respectively; and a lens-like casting member 12 consisting of transparent resin, which fills the cup 3 and a part of the

installation guide.

When compared with the technical solution disclosed in reference 2, the technical solution claimed for protection in claim 15 differs in that (a) the phosphors also include yellow phosphors; and that (b) there is a substantially rectangular light guide, which introduces the light emitted from the light emitting element and outputs it from a light output surface, and phosphors are arranged on this light guide as a film. As recited in the specification, the distinguishing technical feature (a) has a function of enhancing the color rendering of the white light while the distinguishing technical feature (b) is regarded as an alternative light emitting structure in this field.

However, it is disclosed in reference 5 (JP 特开平 11-39917A) that the luminescent spectrum of a white light emitting device consisting of red, green and blue LEDs has a low intensity of the yellow light and this causes deteriorated color rendering of the white light. However, when yellow phosphors are added in the wavelength conversion layer, the color rendering of the white light is improved (referring to paragraph 13-15, page 3, in the specification). As clear from above, reference 5 has disclosed the distinguishing technical feature (a) and this feature serves the same purpose in reference 5 as it does in claim 15. Meantime, reference 6 (JP 特开 2000-156526A) discloses a technical solution having a substantially rectangular light guide 410. This light guide 410 introduces the light emitted from the light emitting element and outputs it from a light output surface, and phosphors 430 are arranged on the light output surface of the light guide 410 as a film (referring to paragraph 30-35, page 4 in the specification, and figure 8-10). Therefore, the light emitting structure of the distinguishing technical feature (b) has been disclosed in reference 6. Accordingly, it is obvious that those skilled in art may combine references 5 and 6 with reference 2 to reach the technical solution claimed for protection in claim 15. As a result, the technical solution claimed for protection in claim 15 does not have any prominent substantive features and neither does it represent any notable progress, thereby resulting in lack of inventiveness.

CONCLUSIONS

Concerning the above, this application shall not be granted until now. The applicant should expound reasons which can substantially support the novelty and inventiveness of the application and amend the application based on the above opinions to eliminate the defects existing therein within the designated period of this notification. Otherwise this application is unlikely to be granted. Also please be noted that the amendment shall be in conformity with Article 33 of the Chinese Patent Law being cited below and shall not go beyond the initial scope of the claims and specification.

An applicant may amend his or its application for a patent, but the amendment may not go beyond the scope of the disclosure contained in the initial specification and claims, and the amendment to the application for a patent for design may not go beyond the scope of the disclosure as shown in the initial drawings or photographs.